

JOURNAL

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North Dakota Stump Lake, June 12-17

A great glacial trough or else a basin formed by burnt out coal beds. Shale crops out commonly along shore but granite boulders abundant above shale & especially so on tops of the many hills & ridges. The lake is deep & strong of salt & alkali.

No fish except minnows & sticklebacks live in it now but up to about 89 pickarel were abundant in it.

They all disappeared as they did from Devils Lake, evidently for lack of spawning grounds. The lake has fallen about 25 feet in 30 years & has no marshy borders or fresh water connections. Still it has much aquatic vegetation & is the home of hundreds of white winged scoters & other ducks which breed over the prairie or in hollow trees.

There is much timber around the lake in a strip half a mile wide or less. It is a good stand of not very large trees of bur oak, elm, boxelder, ash, wild plum, chokecherry & smaller brush.

Aspens grow on cold slopes or low wet places.

The prairie is high & rolling with
many sloughs & coulees, glacial
drift with little erosion. In times
past Shrimp Lake drained into the
Cheyenne River and Devils Lake into
it. Plowing the land has cordantly
taken the water & lowered the lakes.

June 17 Tolva to Devils Lake & then to St. John & thence out to the Hatchery at what they call Fish Lake, or Birchwood P.O. Worked here to the 22^d, and drove over to Carpenter Lake the 21st.

June 22, To Grand Forks

June 24, Grand Forks to Crookston & Manitoba junction & back to Fargo & Valley City. Stopped over night to see Prof. Morris Johnson & catch morning train for Linton.

June 25, Reached Linton & telephoned Eastgate at Winona to come up there. He arrived June 26.

Linton

- Shepherdia argentea*, common along banks
Rhus aromatica, common on bare s. slopes
Prunus besseyi, common on a bare south slope
 and bearing fruit, only 4 to 6 inches high.
Artemisia cana, common on barren flats.
 " *frigida*, abundant, one of the most
 characteristic plants.
Artemisia ludoviciana, abundant, very white.
Gaillardia, abundant. in blossom.
Pentstemon, common " spe.
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Lupinus pubescens, a few, in blossom.
Thoralea esculenta, "
 " *argophylla*, abundant.
Oxytropis lambertiana, " in blossom
Anemone canadensis, common
 " *microphylla*, ? "
Anemone canadensis, " in meadows
Pulsatilla patens, "
Polygala alba, "
Gaura coccinea, "
Mertensia serrulata, " on clay hills, spe.
Oenothera yellow "
 " pink "

Linton & N.

Jan. 27. Caught Gungahams + 2 species of
Peromyscus at Linton, packed up skins
 up skins & started for Stump Lake
 with Eastgate and drove to near
 Napoleon, about 40 miles.

At Tolna, on Beaver Creek,
 the valley lies between high ridges
 and flat topped mesas of the old
 prairie level. The warm slopes
 carry a number of Saurian plants
 and the approach to arid plains
 is shown by several of the
 arid region plants, including 3
 species of cactus - The *Mammillaria*
 are beautifully in bloom & very
 abundant. A line of low timber
 follows the creek part way, in a
 series of interrupted groves
 but I did not get into it, having
 listed the species on a previous
 trip.

The soil is heavy clay with
 a few streaks of coarse gravel.
 It is rich and very productive of
 crops as well as originally of grass
 and native plants.

Linton

Malvastrum coccineum, abn. & blossoming.
Plantago purshi, "
Linum rigidum? Com. spec.
Solidago rigida, "
Phlox douglasii, " on dry hilltops,
Cactus, Mammillaria vivipara? Com. in full flower
Opuntia missouriensis, One large patch on S. slope
 " *fragilis*, Com on barren places.
Polygala alba?, "

Crops show the approach to
 Saueran zone but considerable advances
 over those of the states north & east.
 Corn is a foot high against 4
 inches at Fargo & the grain, flax
 potatoes are correspondingly advanced.
 Several patches of early potatoes were
 in blossom, while farther east & north
 they are not half as large or advanced.
 Garden vegetables are correspondingly ahead.

This is excellent farming country,
 largely cultivated & the town is growing
 rapidly. Very little fruit or trees
 have been started.

After leaving town not a tree
 or bush was seen all day until
 on the lake border near Napoleon
 we found a row of old cottonwoods,
 apparently natives. We came
 up steadily for about half the day
 & then gained the prairie level &
 continued over rolling, glaciated
 prairie with boulders & sloughs &
 good farms. The settlers are largely
 Russians.

Just before reaching Napaolou we
crossed a wide tule marsh and to
the north & south extend for miles the
great lakes, or tule swamps, famous
breeding & hunting grounds for waterfowl.
There were lots of ducks in sight in the
open water and lots more in the tules.
We counted 7 species of ducks.

Marquitos are fierce.

June 28. Did not sleep a wink all night but fought mosquitos which were in a dense swarm and wildly bloodthirsty. They covered my mosquito netting so I could not see through it and crawled under and even through the seam of my sleeping bag and enough got inside to bite me constantly in spite of all I could do. They crawled down in the bag & bit my feet & the whole length of me. There were quarts of dead mosquitos in my bed in the morning. The light streak in the east was very welcome. Eastgate slept in the tent, but with no better success. The horses went wild & broke loose from their picket rope but were caught. Their skins were thick & swollen in the morning, and ours were sore enough so we could sympathize with them.

Caught 2 Perognathus fasciatus some Peromyscus & Microtus.
Started early, came through Papabon & across the rolling prairie to Strater & camped on a hill just north of town. Not a tree or bush all day except in towns. and a few very small ones at ranches. Generally not any.

Strutts & Medina & Chase Lake & ^{Chicago Lake} ~~Chicago Lake~~

June 29 Caught *Thomomys* & *Peromyscus* only. Continued north ^{18 miles} over wire sandy prairie to Medina, then N.W. to Chase Lake & about 6 miles N.E. to a nice ^{Chicago Lake} ~~Chase Lake~~ just beyond a big black tule slough & camped.

All rolling prairie with endless number of sloughs & lakes. A few cottonwoods along old lake margin near our night's camp are the first native trees seen since the few at Papabon. Also chokeberry bushes at our camp lake. *Elaeagnus* bushes first seen near Medina, a small patch 2 miles south of town & others further north & abundant at Chase Lake & our camp ^{at Chicago} lake. A few new plants noted near Medina, the first lily & hairbell.

Chase Lake is a shallow, stinking, barren, sored alkali slough with 4 small flat islands & 2 long points. It is so nasty & shallow & muddy & mean that it has been left for the pelicans. We could see a few young pelicans on the island & one man said there were 2 doz. old birds & another said 100 old & yg. Neither seemed to know much about it as they had never been on the island & there are no boats in the country. We saw only 3 old pelicans, flying south from the lake.

^{townsendi}
Lepus campestris

Shot an old ♀ Lepus campestris, nursing yg.

Weighted $7\frac{1}{4}$ lbs. Seemed unusually large
+ weight estimated at 12 lbs.

Taxidea taxus, Dog found ♀ lodger in barrow
6 mi. S. of Medina. Nursing young but nearly dry.
Mammal $2\frac{1}{2}$, A. $\frac{2}{2}$, Specimen saved and
entered in Eastgate's catalogue.

A few miles N.E. of the lake are ^{two} five big
tule sloughs that offer ideal breeding grounds
for water birds, but the mosquitoes would
kill anyone who attempted to go near one
of these sloughs. Out on the prairie they
are fearful unless a strong wind is blowing,
but near a marsh they are unendurable.

Found the first muddy ducks & townsend
gules of the trip in the ^{Chitlog} lake at camp.

Chicago Lake & Hawksnest Butte.

June 30, Struck east to main road near Martstonmoor, then north along the old Indian road from Ft. Yates & Zotton to the Hawksnest Butte, drove to the top and camped on almost the highest point of the butte, overlooking Carrington 8 mi. to the N.E., land about 25 miles.

Most of the way is over rather rough prairie, with numerous sloughs and lakes & tule marshes, ridges pretty steep and stony, but mainly of good soil & luxuriant grass & prairie vegetation. The country is thinly settled much of the way & woods are poor and do not always connect between ranches. We drove some of the way over prairie, but without any trouble. Heavy rains have filled all the sloughs & water holes & mosquitoes are swarming over the whole country.

A few scrubby little cottonwoods & some willows & chokeberry bushes were found along the borders of sloughs about midway of the distance, but otherwise *Eleagnus* is the only conspicuous shrub of the prairie, except the dwarf rose & a few woody based *Amorpha*s & the abundant *Artemisia frigida*.

Pedicularis

, On Hawkswest Butte an old sharp-tailed grouse with a family of young spluttered out from the side of the wagon. As I followed she limped & fluttered along in front of me but when the dog saw her & came running she flew up about 4 feet from the ground & kept about 6 feet ahead of him till he was over the next ridge. That is her best card, leading coyotes & foxes away by the end of the nose till her young are safe & it seems to be perfectly learned.

Hawkswest Butte is a great glacial pile probably 300 feet above the prairie, evidently a relic of earlier glacial sheets which the last one plowed around & only accentuated. Its N. & E. faces are full of deep gulches with springs & brush & timber, but mainly the Butte is an uplifted mass of the prairie with all the prairie characteristics of sloughs, ridges, boulders, grass & prairie plants. On the high points are at least 7 old Indian mounds, usually 40 or 50 feet across & 4 or 5 feet high, old & flattened & several have been dug into.

The timber of the gulches is mainly bur oak, box elder & green ash, but with a dense scrubby growth of chokeberry, wild rose, Current, gooseberry, red raspberry & crowberry. Catbirds, wrens, flycatchers & yellow warblers are conspicuous, but only *Peromyscus* were caught in our traps & a cottontail was shot. Sharp-tailed grouse are common & a pair of *Buteo swainsoni* seem to have a nest here.

Hawkesnest Butte to Grace City

July 1, Came down the east slope of Hawkesnest Butte and out across the valley to Carrington and across the ~~Shayenne~~^{James} River to Grace City and a few miles beyond to camp.

Aneroid on top of Butte read 2170 feet, in valley at east base 1570 feet and the same at Carrington, 13 miles NE. of the peak. The peak stands 600 feet above the valley but I could not learn the alt. of Carrington to get its actual height.

The Shayenne Valley is broad and rather level, very rich soil and largely under cultivation. Wheat, barley, oats and flax are the principal crops but potatoes & vegetables do well, and corn is quite extensively raised. Golden dent and Northwestern are said to be the best. Minnesota 13 is also a good variety here.

Came about 30 miles and camped near big marshes where mosquitoes are numerous.

McHenry to Stump Lake

July 2 Broke camp & continued east a few miles to McHenry, then north to near Hawes, then east of Tolna & across the Shuyenne River and north to Eastgate's place on Stump Lake, where we arrived at 3 P.M. Took a boy & team back to Tolna & got my baggage & drove to Wisburt's ranch where I staid before, at west end of lake. Came 40 miles to Eastgate's & 10 more to the ranch, the last part in a heavy rain. This completes a 200 mile trip in 6 days, over prairie country all the way, good roads, good farms & good crops. There is practically no waste land & much of it is under cultivation. The cultivation could be greatly improved but good crops come easily.

The weather has been called hot for the whole trip, but a strong S.E. wind blow steadily & at no time was the heat uncomfortable. But for the mosquitoes the trip would have been very pleasant.

To Basswood + Red Willow Lakes

July 8 Drove about 10 miles south of Tolva to Basswood Lake and then 2 miles south of there to a timbered slope on west side of Red Willow Lake, then around by a great number of lakes and sloughs and tule marshes back to Shump Lake.

Basswood Lake is a small, tule bordered body of good fresh water, deep + full of fish, in a basin surrounded by hills and on the west bordered by a fine body of timber, 40 acres or more of dense woods. Basswood is common, also hazel + grape + ampelopsis, but most of the timber is bur oak, Elm, ash, boxelder, thorn, plum, chokeberry, with spots of aspens + balsam poplar. Big springs come out along the sides of the gulches + the bottoms are wet + cold + full of interesting plants.

The woods west of Red Willow Lake are similar, with more extensive spring water bottoms full of aspens, balsam poplar + many northern plants as well as eastern. There is a little basswood, lots of hazel (*C. americanus*) grape + such low plants as *Trilium*, *Sassaparilla*, yellow racemose flowers, dewberry,

Boreal Islands

The spring water is icy cold and the best trapping ground I have found for shrews and boreal mammals is in these springy, swampy bottoms & gulches in the timber. At Stump Lake near the eastern end are similar spring bogs & cold willow gulches where Canadian zone willows, poplars, balsam poplars, *Pyrola secunda* & such plants grow. These are as typical Boreal Islands as are the sphagnum swamps of the east and they account in large measure for the apparent mixture of zones or overlapping.

Aspens grow commonly in cold gulches, on slopes where snow drifts unusually deep, on flat spots where spring water comes close to the surface and along streams or marshes of spring water, around Divils, Stumps, Basswood & Red willow lakes and farther south. So do Balsam poplar & many other Canadian species.

The temperature of the spring water at Stump Lake is 40° in winter, 42° in summer.

Oidemia deglandi -

White-winged scoters are common in Devils Lake as they are in Stump Lake. A few pairs are seen in every section of the lakes wherever we came to the shores. At a rough estimate I should say there were several hundred in Stump Lake and, judging by the great size and those seen in a few places in Devils Lake and the great size of the lake, a few thousand in it.

These are the only places in N. Dak. where I ever saw them or heard of them and as they are the only salt lakes I know of, it is significant that these sea ducks should live & breed here in such numbers.

They are said to breed out on the prairie and I have seen one or sometimes a pair circling over the prairie and one pair in a little rain pool on the prairie. Eastgate says they do not nest until about the first of July.

To Devils Lake

July 9, Drove from Stump Lake west to Devils Lake and camped 4 miles east of the old Mission at edge of the timber. Set traps in the woods & along slough.

The prairie is generally pretty rough and hilly, especially near the lakes, where series of hills & ridges probably mark the old moraines. Some wide stretches of prairie are rather level & flat. There are generally under cultivation and much of the rolling country is also. A considerable part of the Indian Reservation is unbroken prairie, although the land was allotted years ago and is largely owned by white men now. It is good land but rather rough in places. The timber along the lake shores is the same low, dense woods of Elm, Oak, Ash, boxelder, aspen, balsam poplar, thorn, plum, chokecherry, grape, woodbine, bittersweet, hoptans etc. as is found at most of the lakes over this part of the state.

Devil's Lake to Sweetwater Lakes

July 10. Broke camp & by 8 AM were on the road. Caught only *Eutamias*, *Microtus* & *Peromyscus*.

Half way to the Mission we drove through an Indian camp in a beautiful spot on the prairie, overlooking a lake, the Devil's Heart Butte & Sully's Hill and the end of rolling prairie. The white tipis glistened in the sun & the picturesque Sioux standing or squatting on the ground. Other tipis were seen near the little houses of the Indians, put up for summer use, just as the gray squirrels build summer nests in the trees to get rid of the fleas that swarm in their winter houses.

The old Mission stands in the woods on the south side of the lake but is not a very attractive spot. Success lonesome & illkept.

The woods are brushy and the houses & buildings very common. The church might be of any little country town & the school would pass for a little wayside hotel.

Crossed the Narrows of Devils Lake, then the Military Wood Reserve, to the Chautauque Grounds & Biological Laboratory. Here we met Yawel Brown & Tufty & saw Dr. Grassick of Grand Forks.

The Wood Reserve & Chautauque Grounds occupy the Peninsula, a timbered strip running nearly across the lake and including 1100 acres of woods.

This is untouched forest of large old elms & oaks & ash & boxelds. Groves of Aspens grow in springy places.

This forest is the only one I have seen that has not been cut & burnt & the trees are old & large, but not very high. Elms 4 feet in diameter are not over 50 or 60 feet I should judge.

A tangle of grape, Ampelopsis, Ceanothus & hop vines on the shrubby undergrowth makes a very dense undergrowth.

The place would make a fine deer & elk park if fenced & could be used for the purpose as it is now held as a Military reserve.

Sully Hill is also a park of

probably 5 or 6 sections (Eastgate thinks)
on the south side of the lake in the big
forest of that slope. It is a
great rounded hill

black with forest except on the top
where there is open prairie.

Springs of cold gulches observed
on its slopes. It also should be
a game park & well fenced.

Deer, Elk, & if some of the basal prairie
were included buffalo & Antelope could be
inclosed & do well all the year around.

Crow Devils Heart Butte is
just S. E. of Sully Hill, a sharp,
bare grassy butte of a
conical form.

It is merely a sharp
hill of the maranel series bordering
the lake.

Continued from the Biological
Station to Devils Lake town. Then
north to the west end of Sweetwater
Lakes and camped on a timbered
ridge near one of the large bodies
of water forming this series
of lakes.

Sweetwater Lakes

Bison bison, old bones & horns are numerous in the woods and around the shores of the lakes.

Cervus canadensis - An old elk antler was found near our camp in the timber by the lake.

Citellus franklini - Abundant in the brushy places around the lakes.

Citellus thomomys - One seen on the prairie but none in the brush.

Citellus richardsoni - Abundant over all the prairie along roads & in fields. Are beginning to cut the heading grain and have pulled down considerably.

Peromyscus m. leucotis - Abundant but some taken.

Zapus campestris - One seen and three cut grass piles are common in edge of meadows and brush.

Microtus deumouli - Abundant, only 2 taken, but runways & cuttings seen all over marshes & in edge of sloughs.

Fiber z. cinnamomum - Common in the lakes. Numerous holes run out into the bays.

Thomomys talpoides - Common both over prairie & in woods & meadows.

Lepus f. similis - Cottontails are numerous in the woods & brush. Eastgate says they reached Saranore in 1890. One specimen sent.

Sweetwater Lakes

July 11 - Caught Blechnum & Microtus. Saw 12 skunks & signs of cottontails & muskrats & tracks of badgers.

Eastgate saw a zapus & picked up an old elk horn. Cottontails are common & there may be varying bands in the thickets. Peromyscus have eaten the cochlitrus all over the sandy beaches.

Buffalo bones are numerous in the woods & on the lake shores. Franklins grandisquirit is everywhere in the bushes. One bat was seen near camp.

Sweetwater lakes have gone down till they are now disconnected and we camped in the middle between 4 or 5 of them on a wooded point. Most of the borders are timbered down to the ice bank, then a sloping beach of sandy or weedy ground, then tules or reeds in wide borders out into the shallow margins. The Southeast lake, at which we camped in the NW corner, is shallow and water plants come to the surface over most of it. Ducks & geese are numerous over this & most of the lakes, some of the lakes are more open with prairie around part or all of the shores, and little or no plant life and these have fewer birds. Others are marshy bordered or just sloughs.

Sweetwater lakes

Lepus^{t.}canadensis - Common over prairie.
Lepusamericanus - Eastgate thinks they are here in the thickets of aspen & willow.
Says they are common at Devils Lake & at Stump Lake.

Canislotrans^{noveboracensis} - Coyote tracks seen along lake shores.
Taxideatexas - Tracks & holes ^{are} common.

Neophteshudsonica - Skunks are ^{are} numerous & we saw 12 one evening near camp, mostly half grown. They hunt in thickets & meadows along lake & probably destroy great numbers of eggs & young of water birds. Eastgate thinks the small flocks of young ducks are due to skunks.

Lutrolavison^{lutifera} - Said to be common about the lake.
See note by Eastgate on a breeding den.

Blarinabreviceauda - Two were caught under grass & weeds in a dry marsh, in Microtus runways.

Bat - one seen flying in evening but not secured.

of shallow water, full of water plants & algae.

There is a large area of timber and brush land in between the lakes and timber borders them on most of the outside margins. The surrounding country is all prairie, largely under cultivation in grain, flax, corn & potatoes.



